Automatic flower-selling equipment

The subject of the invention is automatic flower selling equipment, which contains a house including storage space suitable for storing and protecting flowers, a bearing unit situated in the storage space of the house for displaying the flowers, a moving unit connected to the bearing unit and a control unit connected to the moving unit, the control unit is connected to a selecting partial unit situated on the casing of the house, the bearing unit has a supporting column attached to the house in a rotatable way and supporting structures attached to the supporting column below each other, where the supporting structures have a supporting tray suitable for supporting the flowers, and one or more delivery doors are arranged on the casing of the house, and the delivery door is connected to a delivery outlet for taking out the chosen flowers.

Automatic vending machines have become widely used by now in numerous fields of life. Basically the recommended products or services are placed in closed storage units in public areas, where average consumers can buy or use them without the help of a salesperson, in the case that they pay the right amount of money. Such vending machines are also known in the field of flower sale.

One of these, described in the international publication document No. WO 99/22347, relates to a solution suitable for the individual sale of flowers. Here the flowers are situated in several horizontal lines, on a spiral in each line. The spiral delivery devices further the flowers and send the flower nearest to the delivery outlet into the delivery window accessible to the buyer.

However, the basic disadvantage of the construction is that because of the construction and operation of the furthering and feeding mechanism it is not possible to select the flower the buyer intends to buy, and it is not possible either to view the selection of flowers situated in the storage space of the equipment.

A further essential deficiency is that storing the flowers to be sold in a horizontal position has an unfavourable effect on the shelf life of the plants, they deteriorate quickly and become impossible to sell.

It is also a disadvantage that the individual flowers may get damaged while they are being furthered, which reduces the chances of selling them even more.

A further disadvantage of the equipment is that due to the unfavourable storage position and furthering method the flowers do not have a continuous water supply, which has a negative effect on the conditioning and shelf life of the flowers.

Equipment suitable for selling pot plants, bouquets and other green plants is described in patent description No. EP 710.936. This structure contains a rotatable bearing unit inside the closed storage space, which makes it possible for the buyers to view all the flowers and plants offered for sale and choose from them as they like. The continuous water supply of the plants and flowers is provided by a water-recirculating unit.

However, the disadvantage of this construction is that it is not suitable for selling single flowers independently, and because of its construction, despite the fact that it occupies a large space, it is suitable for the storage and sale of only a small amount of flowers.

Our aim with the invention was to overcome the deficiencies of the known flower selling equipment and to create a version, which, despite its small space demand, is suitable for storing a large amount of different plants and flowers in an energy sparing and cost friendly way also ensuring that long-lasting freshness and for delivering such plants and flowers in a simple way, quickly, excluding the possibility of unauthorised access.

The construction according to the invention is based on the recognition that if flowers are placed in a bearing unit constructed differently from the known solutions, including special separating pieces, and the delivery window is constructed to suit the supporting structure, then the flowers can be stored in a favourable, nearly vertical position, so that

in the course of their delivery only one single flower is accessible in each case, and so the task can be solved.

In accordance with the set aim the automatic flower-selling equipment according to the invention, – which contains a house including storage space suitable for storing and protecting flowers, a bearing unit situated in the storage space of the house for displaying the flowers, a moving unit connected to the bearing unit and a control unit connected to the moving unit, the control unit is connected to a selecting partial unit situated on the casing of the house, the bearing unit has a supporting column attached to the house in a rotatable way and supporting structures attached to the supporting column below each other, where the supporting structures have a supporting tray suitable for supporting the flowers, and one or more delivery doors are arranged on the casing of the house, and the delivery door is connected to a delivery outlet for taking out the chosen flowers, – is constructed in a way that at least some of the supporting structures have a distributing ring co-operating with the supporting tray, situated above the supporting tray and having a projection perimeter at least partly bordering on the outside the perimeter of the projection of the supporting tray falling on the reference plane at right angles to the longitudinal axis of the supporting column, on the distribution ring there are separating sheets practically positioned radially and arranged at regular intervals, and the curve of the distribution ring between two separating sheets is identified with an individual distinctive mark, and the delivery outlet situated in the environment of the distribution ring is equipped with a cross-section restricting mask suiting the size of the interval between the two separating sheets, and in this way the delivery outlet is restricted to the delivery window suiting the interval.

A further criterion of the equipment according to the invention may be that at least some of the supporting trays are equipped with a water-storage trough.

In the case of a version of the invention a water recirculating partial unit is placed in the house, and the water recirculating partial unit has a water-storage tank, a pump and water-conducting passages. At least some of the water-conducting passages are situated inside the supporting column.

From the aspect of the equipment it may be favourable, if the selecting partial unit is combined with a money-handling partial unit and/or the storage space of the house is connected to air-conditioning equipment.

In the case of a further construction of the invention the distribution ring is combined with a skirt situated below it.

In another different realisation of the equipment at least a part of the casing of the house is constructed of large arched door elements made of a transparent material, e.g.: plexiglas, and the door elements are situated near and along the supporting structures.

In a further different construction of the invention the selecting partial unit has a display unit and a data input unit.

In another different version of the equipment the individual curves of the distribution ring and the position of the supporting column in relation to the delivery door are allocated to each other with the help of a distinctive mark, via the control unit. An opening structure is inserted between the house and the delivery door.

The most important advantage of the automatic flower-selling equipment according to the invention is that due to the bearing unit of a novel construction it is suitable for selling potted plants, bouquets and single flowers at the same time. The construction different from the known solutions also makes it possible to change over from selling a certain type of plants or flowers to selling another type in a short period of time, so the same equipment can be used to sell only potted plants or only bouquets or only single flowers or an optional combination of them.

It is also an advantage that the equipment, especially in the case of single flowers, that despite the fact that it occupies a small space it is suitable for storing a large amount of flowers for a long time. With the help of the distribution rings that can be integrated in the bearing unit it is also made possible for the buyers to view all the flowers for sale

before making a decision, so that they can buy the flowers they find the most suitable. This possibility is due to the special arrangement of the single flowers in the storage space.

Another advantage is also due to the arrangement of single flowers different from the known solutions, namely that the chosen flowers are delivered much more carefully than in the case of traditional flower-selling equipment, so the danger of damaging the chosen single flowers is practically eliminated.

It is also favourable that due to the construction of the distribution ring holding single flowers and the use of the specially formed cross-section restricting mask unauthorised access to the flowers can be excluded, which means that it is not possible to get the flowers situated in the storage space without paying the right price for them.

Another advantage is that the casing of the house, its large door and the geometrical shape of the casing makes it easier to put in the flowers for sale and to clean the internal space of the equipment, and it also have a favourable effect on the buyers' possibility of choice, and its attractive appearance encourages people to buy flowers. Through the large doors made of a transparent material the bearing unit filled with single flowers looks like one big bush of flowers, where the buds of the individual flowers have different identifiers. So far no equipment has shown such an arrangement or appearance.

Below the automatic flower-selling equipment according to the invention is described in connection with a construction example, on the basis of a drawing. In the drawing

figure 1 shows the side view of the selling equipment partially in section,
figure 2 shows a part of figure 1 taken from direction II,
figure 3 shows the basic diagram of a part of the bearing unit.

Figure 1 shows a version of the flower selling equipment 1 according to the invention, with the help of which potted plants, bouquets and single flowers 2 can also be sold. It can be seen that the house 10 of the flower-selling equipment 1 is surrounded with a

casing 12. Inside this casing 12 there is a storage space 11 containing a bearing unit 20, a moving unit 30, a control unit 40, a water recirculating partial unit 50 and air-conditioning equipment 60.

The door elements 16 with a large transparent surface are parts of the casing 12, practically – as it can be seen in figure 2 – they are made of plexiglas bent to the desired shape, and spaced at small intervals they follow the basically cylindrical covering surface of the bearing unit 20. The delivery door 13 also belongs to the casing 12, and behind it there is the delivery outlet 14. The delivery outlet connects the storage space 11 of the house 10 with the delivery door 13. The dimensions of the delivery outlet 14 are chosen so that the largest plants or flowers 2 that can be placed in the flower-selling equipment can be taken out through it without any damage. In accordance with this practically cross-section-restricting masks 15 restricted with a delivery window 15a should be placed in the delivery outlets 14 serving to deliver single flowers 2. These cross-section-restricting masks – together with the construction of the bearing unit 2- of the right shape – prevent unauthorised access to the content of the storage space 11 of the flower-selling equipment 1 through the delivery outlet 14.

Figure 2 also shows that the between the delivery door 13 and the relevant part of the casing 12 of the flower-selling equipment 1 an opening structure 70 is built in the delivery outlet 14, with the help of which the delivery door 13 opens automatically at a certain stage of the purchase.

Returning to figure 1, it also shows that the bearing unit 20 includes a supporting column 21 and supporting structures 22 attached to the supporting column 21, built from different elements. Every supporting structure 22 has a supporting tray 23 for supporting the flowers 2. At the same time there are water-storage troughs in at least those supporting trays 23 that carry single flowers 2.

Beside a supporting tray 23 the supporting structures 22 suitable for displaying single flowers 2 also contain a distribution ring 24 each, positioned symmetrically to the longitudinal axis 21a of the supporting column 21, which distribution ring is equipped

with radially positioned separating sheets 25. It can be seen in figure 2 that with the separating sheets 25 fixed in an arranged way the distribution ring 24 is divided into equally sized curves 24a. The "T" interval belonging to a curve 24a between two separating sheets 25 is exactly the same as the size of the same direction of the delivery window 15a of the cross-section restricting mask 15 fixed in the delivery outlet 14.

At the same time figure 1 also shows that the distribution ring 24 is practically equipped with a skirt 26 situated below it, attached to the separating sheets 25. The skirt 26 is a cylindrical shell shaped plate insert, which is also positioned symmetrically to the longitudinal axis 21a of the supporting column 21. A distinctive mark 24b, e.g.: an Arabic figure, belongs to each one of the curves 24a between the separating sheets 25 or to each part of the skirt situated below them belonging to the given curve 24a, which distinctive mark 24b clearly identifies the area characterised by a sector bordered by the curve 24a, a part of the skirt 26 and the separating sheets 25, that is the physical storage place of one single flower 2.

In the case of supporting structures 22 that have neither a distribution ring 24 nor a skirt 26 the distinctive marks 24b are obviously attached to the appropriate parts of the supporting trays 23 forming the supporting structure 22.

It can also be seen in figure 1 that the dimensions of the distribution ring 24 exceed the dimensions of the supporting tray 23, so with the help of figure 3 it can be understood that the "K2" projection perimeter of the distribution ring 24 falling on the "S" reference plane at right angles to the longitudinal axis 21a of the supporting column 21 encircles the "K1" perimeter of the supporting tray 23 falling on the "S" reference plane. According to figure 3 the "K1" perimeter and the "K2" projection perimeter are concentric circular rings. Consequently, as shown in figure 1, the single flowers 2 are situated in a slightly canting position in the supporting structure 22 formed by the distribution ring 24 and the supporting tray 23 together. If the distances between the distribution rings 24 placed at different heights along the supporting column 21 and obviously the distances of the supporting trays 23 belonging to the individual distribution rings 24 are chosen favourably, then on the part of the bearing unit 20

where single flowers 2 are displayed the viewer can practically see a skirt consisting of flower-buds, where under the individual displayed flower-buds there are distinctive marks 24b for the identification of the flower-buds.

For the attractive arrangement of single flowers 2 the stem of the flower 2 placed in the upper distribution ring 24 must go through the space bordered by the curve 24a and the separating sheets 25 of one or more distribution rings 24 below the flower 2, and threaded through them it must end in the supporting tray 23 belonging to the given supporting structure 22.

The moving unit 30 is responsible for rotating the supporting column 21 around the longitudinal axis 21a. The moving unit 30 includes the motor 31 and the traversing partial unit 32, which in this case consists of a cogwheel 32a fitted onto the supporting column 21 and another cogwheel 32b attached to the motor 31.

The water-storage troughs 23a of the supporting trays 23 of the bearing unit 20 is supplied with water for the flowers 2 by the water-recirculating partial unit 50. The water-recirculating partial unit 50 contains a water-storage tank 51, a pump 52 and the water-conducting passages 53. In the case of this construction the water-conducting passages go inside the supporting column 21, and in this way they connect the water-storage tank 51 with the water-storage troughs 23a of the supporting trays, interposing the pump 52.

The operation of the flower-selling equipment 1 is controlled and directed by the control unit 40 situated in the storage space 11. The control unit is combined with a display unit 41a fitted on the casing 12 of the house, a selecting partial unit 41 equipped with a data input unit 41b and a money-handling partial unit 42. The selecting partial unit 41 sends information about the buyers' choice to the control unit 40, while the money-handling partial unit 42 sends information about the payment of the price to the control unit 40.

In the course of the operation of the flower-selling equipment 1 according to the invention first the door elements 16 of the casing 12 of the house 10 must be opened,

and the supporting structures 22 of the bearing unit 20 must be filled with flowers 2. Potted plants 2 are placed on a simple supporting tray 23 separated with separating elements, bouquets 2 are placed on a supporting tray 23 of a slightly different shape. The placement of single flowers 2 into the bearing unit 20 needs more attention. The stem of each single flower 2 must be threaded through curve 24a between the two separating sheets 25 of a distribution ring 24 in a way that the stem of the flower 2 should go through the space bordered by further distribution rings situated below the given distribution ring, and then it should end on and lean against the supporting tray 23 belonging to the distribution ring 24. When there is a single flower 2 in each curve 24a, the door element 16 can be closed and the flower-selling equipment is ready to serve customers.

After turning on the flower-selling equipment 1 the motor 31 of the moving unit 30 starts turning the other cogwheel 32b of the traversing partial unit 32, which starts up the one cogwheel 32a. The rotation of the one cogwheel 32a starts to rotate the supporting column 21 of the bearing unit 20. The supporting structures 22 move with the supporting column 21 rotating around its longitudinal axis, and in this way the customers standing in front of the flower-selling equipment can look through the transparent surface of the door elements 16 and view all the flowers 2 for sale passing in front of them without having to change their position.

After turning on the equipment the air-conditioning equipment also starts to work creating conditions 1 that are the most suitable for keeping the flowers 2 fresh for a long time, in the storage space 11 of the house 10 of the flower-selling equipment, in accordance with the normal operation of such equipment. Obviously by turning on the flower-selling equipment 1 the water-recirculating partial unit 50 also starts to work. AS a result of this the pump 52 pumps the water from the water-storage tank 51 through the water-conducting passages 53 into the water-storage troughs 23a situated in the supporting trays 23 of the supporting structures 22 of the bearing unit 20, and from there the flowers 2 can use the water as they need it. The moving unit 30, the air-conditioning equipment 60 and the water-recirculating partial unit 50 continue to operate as long as the flower-selling equipment 1 is turned on.

When a customer has chosen the flower he/she finds the best, he/she enters the distinction mark 24b belonging to the given flower 2 via the data input unit 41b of the control unit 40, and he/she can check whether the entered distinction mark 24b is right on the display unit 41a of the selecting partial unit 41. After entering the distinction mark 24b the customers puts the prescribed price in the money-handling partial unit 42.

After checking the paid amount and the received distinction mark 24b the control unit 40 instructs the moving unit 30 to rotate the curve 24 with the entered distinction mark 24b or a given part of the supporting tray 23 of some other supporting structure 22 to the delivery outlet 14 situated behind the delivery door 12 of the casing. After the positioning, instructed by the control unit 40 the opening structure 70 opens the delivery door 13 belonging to the given delivery outlet, and the customer can put his/her hand in there. The chosen flower 2 – depending on its size – can be taken out from the storage space 11 of the house 10 of the flower-selling equipment 1 through the delivery outlet 14, or if it is a single flower 2, it can be taken out through the delivery window 15 of the cross-section restricting mask 15 fitted in the delivery outlet 14.

The flower-selling equipment according to the invention can be used at any frequented public places where passers-by can satisfy their flower-purchasing demands.

List of references

1 flower selling equipment
2 flower
10 house
11 storage space
12 casing
13 delivery door
14 delivery outlet
15 cross-section-restricting mask
15a delivery window
16 door elements
20 bearing unit
21 supporting column
21a longitudinal axis
22 supporting structure
23 supporting tray
23a water-storage trough
24 distribution ring
24a curve
24b distinctive mark
25 separating sheet
26 skirt
30 moving unit
31 motor
32 traversing partial unit
32a cogwheel
32b another cogwheel
40 control unit
41 selecting partial unit
41a display unit
41b data input unit
42 money-handling partial unit
50 water recirculating partial unit
51 water-storage tank
52 pump
53 water-conducting passage
60 air-conditioning equipment
70 opening structure
"K1" perimeter
"K2" projection perimeter
"S" reference plane
"T" interval